

WHAT IS CLAIMED IS:

1. A liquid fuel cell device comprising: a liquid fuel cell body including a fuel electrode, an oxidizer electrode placed opposite to the fuel electrode and an electrolyte layer provided between the fuel electrode and the oxidizer electrode; and a liquid fuel supply system configured to supply a liquid fuel to the fuel electrode,

the liquid fuel supply system comprising a first tank configured to contain a concentration-adjusted liquid fuel and supply the concentration-adjusted liquid fuel to the fuel electrode; and a second tank configured to contain a high-concentration liquid fuel and supply the high-concentration liquid fuel to the first tank;

the first tank comprising a first internal liquid transfer device configured to transfer the concentration-adjusted liquid fuel to the fuel electrode;

the fuel cell device further comprising a first external driving device provided outside the first tank and configured to drive the first internal liquid transfer device, the first external driving device being physically separated from the first internal liquid transfer device.

2. The device according to claim 1, wherein the first internal liquid transfer device comprises a first

liquid transfer tube and a first tube driving device configured to expand and compress the first liquid transfer tube, thereby transferring the liquid fuel.

3. The device according to claim 2, wherein the
5 first liquid transfer tube comprises a check valve.

4. The device according to claim 1, wherein the first internal liquid transfer device and the first external driving device are magnetically coupled.

5. The device according to claim 1, wherein the
10 second tank comprises a second internal liquid transfer device configured to transfer the liquid fuel to the first tank, and the liquid fuel cell device further comprises a second external driving device provided outside the second tank to be physically separated from
15 the second internal liquid transfer device and configured to drive the second internal liquid transfer device.

6. The device according to claim 5, wherein the second internal liquid transfer device further
20 comprises a second liquid transfer tube and a second tube driving device configured to expand and compress the second liquid transfer tube, thereby transferring the liquid fuel.

7. The device according to claim 6, wherein the
25 second liquid transfer tube comprises a check valve.

8. The device according to claim 5, wherein the second internal liquid transfer device and the second

external driving device are magnetically coupled.

9. The device according to claim 1, wherein the liquid fuel comprises methanol.

10. The device according to claim 1, further
5 comprising a diluent tank configured to contain a diluent which dilutes the high-concentration liquid fuel supplied from the second tank to the first tank to adjust a concentration of the liquid fuel, and supply the diluent to the first tank.

10 11. The device according to claim 10, wherein a magnetic stirring device is provided in the first tank.

12. The device according to claim 10, wherein the liquid fuel comprises methanol and the diluent comprises water.

15 13. The device according to claim 1, further comprising a conduit configured to supply a liquid reaction product generated at the oxidizer electrode to the first tank as a diluent which dilutes the high-concentration liquid fuel supplied from the second tank
20 to the first tank to adjust a concentration of the liquid fuel.

14. The device according to claim 13, wherein a magnetic stirring device is provided in the first tank.

25 15. The device according to claim 13, wherein the liquid fuel comprises methanol and the liquid reaction product comprises water.

16. The device according to claim 1, wherein the

first tank is made of a corrosion resistant material.

17. The device according to claim 16, wherein the corrosion resistant material is selected from the group consisting of Ti, a fluoro-resin, a butadiene rubber, a
5 styrene rubber, a butyl rubber, an ethylene-propylene rubber and a natural rubber.

18. The device according to claim 1, wherein the second tank is made of a corrosion resistant material.

19. The device according to claim 18, wherein the
10 corrosion resistant material is selected from the group consisting of Ti, a fluoro-resin, a butadiene rubber, a styrene rubber, a butyl rubber, an ethylene-propylene rubber and a natural rubber.

20. The device according to claim 1, wherein the
15 second tank is detachably connected to the first tank.

21. The device according to claim 1, wherein the first internal liquid transfer device is provided with a corrosion resistant coating.

22. The device according to claim 21, wherein the
20 corrosion resistant coating comprises Ti, a fluoro-resin or a polyethylene.

23. The device according to claim 5, wherein the second internal liquid transfer device is provided with a corrosion resistant coating.

24. The device according to claim 23, wherein the
25 corrosion resistant coating comprises Ti, a fluoro-resin or a polyethylene.